2018-08

Evidence from a quasi-experimental study for the effectiveness of the influenza vaccination against myocardial infarction in UK adults aged at least 65 y

Streeter, Adam

PHARMACOEPIDEMIOLOGY AND DRUG SAFETY

Evidence from a quasi-experimental study for the effectiveness of the influenza vaccination against myocardial infarction in UK adults aged at least 65y

Background

A recent investigation using routinely collected health records found the influenza vaccine to be effective against heart failure. However, treatment of overt myocardial infarction (MI) events is important in preventing progression to heart failure, especially in older adults, yet evidence for the association between respiratory disease and subsequent MI is from observational data and subject to confounding bias.

Objectives

Using linked electronic health records, this study aimed to adjust for unmeasured confounding in the estimation of the effectiveness of the influenza vaccine against MI in adults aged 65y and older in the UK.

Method

Design

Cohorts of patients in the UK from general practices registered to the Clinical Practice Research Datalink with linkage to Hospital Episode Statistics.

Setting

Adults aged 65y and older recruited from September in annual cohorts from 1997 to 2012 with no record of influenza vaccination in the preceding five years.

Exposure

Influenza vaccination

Outcome measure

Hospitalisation for MI as set out in the protocol for the study.

Statistical analysis

Survival times until MI in new beneficiaries of the influenza vaccine versus patients without vaccination were analysed for each annual cohort using a novel pairwise method to adjust for confounding bias. This alternative formulation of the prior event rate ratio method utilised data on each annual cohort from the preceding vaccine-free year, and the results from both methods were compared.

Results

Cohort sizes ranged from 56151 patients in 2002 to 144566 in 2012. The hazard ratios (HR) for influenza vaccination from a Cox regression adjusting for age and gender were either greater than, or not significantly different from unity. After adjustment using the PERR method, the HRs were significantly less than unity (at 5% level), varying between 0.43 and 0.74, except in 2001 (HR=0.89). The same annual trend was closely mirrored in the pairwise-adjusted results, which were significantly below unity, varying between 0.37 and 0.66, except for 2001 (HR=0.81).

Conclusions

After adjustment for unmeasured confounding bias, there was real-world evidence of a protective effect against MI from the influenza vaccination in patients aged 65y and older in every from year 1997 to 2012, except 2001.